

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/526,737
Applicant : Enrico Cinti, et al.
Filed : March 4, 2005
Docket No. : 37891

DECLARATION OF GIOVANNI PREDIERI

Giovanni Predieri declares as follows:

1. I presently reside in Italy and my professional address is Dipartimento di Chimica G.I.A.F., University of Parma, Viale G.P. Usberti 17/A, I-43100 Parma, Italy.
2. I graduated from the University of Parma, in Parma, Italy, in 1972 with a degree in Chemistry. From 1976 -1985 I was a Contract Researcher and full-time teaching Assistant in Chemistry at the University of Parma. From 1986-1994 I was an Associate Professor of Analytical Chemistry at the University of Parma. From 1995-1999 I was an Associate Professor of General and Inorganic Chemistry at the University of Parma. From 2000 to the present I have been a Full Professor of General and Inorganic Chemistry at the University of Parma. My recent research activity includes metal chelates with organic ligands, sol-gel materials, and metal carbonyl clusters. I have over 200 papers published in peer reviewed international journals in the field of chemistry.
3. My present relationship with Agristudio S.R.L., the assignee of the above-identified patent application, is as follows: I am employed as a consultant by Agristudio S.R.L. Also, I am an in-law of Antonio Ciribolla, the inventor of the applied reference WO 00/53032.
4. I have reviewed the above-referenced patent application No. 10/526,737 and the April 26, 2007 Office action and the references applied therein.
5. In the April 26, 2007 Office action, the Examiner has rejected the claims under 35 USC 103 as being unpatentable over Ciribolla, WO 00/53032. As noted by the Examiner, this reference teaches a direct reaction of methionine hydroxy analogue (MHA) with the carbonate of bivalent metal in the presence of water. As now presented, present claim 26 recites a direct reaction of MHA and/or salts thereof with an oxide of the bivalent metal, rather than with a carbonate of the bivalent metal, as taught by Ciribolla. On page 3 of the Office action, the Examiner suggested that a declaration of unexpected or surprising results would be sufficient to provide evidence of non-obviousness over Ciribolla. Such

evidence is now presented.

6. The benefits of the present invention over Ciribolla can be more conveniently understood when, for example, zinc is considered as the bivalent metal. In this case, Ciribolla would teach the following reaction: $\text{ZnCO}_3 + 2\text{HMHA} \rightarrow \text{Zn}(\text{MHA})_2 + \text{H}_2\text{O} + \text{CO}_2$. Correspondingly, the present invention teaches the direct reaction between the metal oxide and MHA, which is shown as follows: $\text{ZnO} + 2\text{HMHA} \rightarrow \text{Zn}(\text{MHA})_2 + \text{H}_2\text{O}$. Surprisingly and unexpectedly, the oxide reaction solves four undesirable effects of the carbonate reaction. As can be seen, the carbonate reaction also produces carbon dioxide (CO_2), which is not produced by the oxide reaction. The production of CO_2 from the Ciribolla carbonate reaction causes four very undesirable effects, as follows:

- (1) The CO_2 takes away heat from the reaction mixture thus contributing to lower the reaction rate; the invented reaction using the metal oxide does not evolve CO_2 and accordingly does not take away heat in the reaction mixture so that a higher reaction rate may be attained.
- (2) The production of CO_2 in the Ciribolla reaction favors the diffusion into the environment of mercaptanes and other disagreeable smelling sulfurated species, which are already present as trace amounts in commercial methionine hydroxy-analogue; since the invented reaction using the metal oxide does not evolve a gas, it does not facilitate or favor such diffusion of disagreeable species.
- (3) The Ciribolla reaction, which rapidly evolves CO_2 , causes spattering, which can be dangerous for the operators. The invented reaction, using metal oxide, does not evolve CO_2 or other gas and accordingly does not cause this spattering.
- (4) The Ciribolla reaction, evolving CO_2 , causes the formation of foam that makes the correct and appropriate mixing of the reagents very difficult, thus resulting in a lower yield. The invented reaction, using metal oxide, does not evolve gas and accordingly does not suffer from such a formation of foam.

7. Thus, surprisingly beyond any optimistic expectation, the invented reaction, using metal oxide, has remarkable benefits over the less desirable Ciribolla reaction using the metal carbonate. The invented reaction with the metal oxide, in which no gas evolution occurs, results in a reaction which is (a) faster, (b) cleaner, (c) safer, and (d) more efficient. In view of the surprising and remarkable benefits of the present invention, wherein metal oxide is used rather than metal carbonate, it can be seen that the present invention is surprisingly and unexpectedly far superior to the prior art of Ciribolla, wherein the metal carbonate is used.

8. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements

were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the patent application or any patent issued thereon.



October, 16th, 2007

Date

Giovanni Predieri